Development of a Biodiesel Industry in Idaho

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What is biodiesel?

- Bio-based diesel fuel produced by a chemical reaction between methanol (or ethanol) and an oil or fat.

- 100 lb canola oil + 10 lb methanol

  ➔ 100 lb biodiesel + 10 lb glycerin

Applications of biodiesel

- As a neat fuel (B100).
- As a medium-level blend (B5-B50). Blends can be used to meet Energy Policy Act mandates (B20 essentially = 1/5 vehicle).
  - The Jeep Liberty uses B5 as the factory fill.
- As a low-level blend (1% - 2%). Small amounts of biodiesel can restore lubricity to low-sulfur fuels.
  - John Deere uses B2 as the factory fill in all of their vehicles

University of Idaho Test Vehicles

Currently operating on 100% mustard ethyl esters

The University of Idaho has the largest and most experienced biodiesel research program in the United States

Advantages of Biodiesel

- Biodegradable, nontoxic, renewable
- Lower emissions, climate change neutral
- Requires no engine modifications (except replacing some fuel lines on older engines).
- High cetane number and excellent lubricity.
- Very high flashpoint (>300°F)

Disadvantages of biodiesel

- Biodiesel has 8% less energy per gallon. Max power and miles per gallon will drop by that amount.
- Biodiesel is less oxidatively stable than petroleum diesel fuel. Old fuel can become acidic and form sediments and varnish. Additives can prevent this.
- Biodiesel will gel (like regular diesel fuel). Blending and additives can control this.
- Biodiesel can cause filter plugging (at low temps, due to polymers, fuel tank deposits, other contaminants). Filtering keeps the fuel clean.

This is the right time for biodiesel

- Petroleum prices are at all-time highs.
- Federal government incentives provide excellent support:
  - CCC program (buys feedstock for 1st year, 50% in 2nd year, 30% in 3rd year, 15% in 4th year)
  - Federal tax credit ($1./gallon of biodiesel)
  - Small producer credit ($0.10/gallon if less than 15 million gallons)
- Current price: $2.30 -$3.00/gallon depending on location and how much of the tax credit is passed on to the consumer.

Obstacles to the development of a biodiesel industry in Idaho

- Risk to capital
  - Investors are concerned about risk if petroleum prices go down, or incentives go away.
- Which comes first: Crop or processing plant?
  - Farmers won’t plant crop if there is no processor, processor won’t invest if there is no crop.
- Some way is needed to distribute the risk

Minnesota: A successful example of state support

- On Sept. 29, 2005, all diesel fuel sold in Minnesota for use in engines is required to contain 2% biodiesel.
- The law was passed in 2002 but did not become effective until June 2005 AND there was sufficient production capacity in the state to supply 50% of the requirement (8 million gallons/year).
- Current capacity in Minnesota is 65 million gallons/year.
- Current price of biodiesel is equal to diesel fuel so fuel with 2% biodiesel costs the same.

A 2% mandate in Idaho

- Current annual diesel fuel consumption is 375 million gallons (on-highway+off-highway).
- 2% would require 7.5 million gallons of biodiesel.
- At 100 gallons/acre this would provide an in-state market for 75,000 acres of canola.
- Idaho canola and mustard seed oils provide superior biodiesel compared with soy oil that provides a competitive advantage.

Benefits to the state

- 2% biodiesel provides needed lubricity to low-sulfur diesel fuel.
- Encourages a more diverse set of rotation crops for wheat.
- Encourages private investment by distributing risk between plant developer, farmers, and fuel consumers.
- Encourages in-state processing (oilseed crushing and biodiesel processing) to add value to a product grown in the state.
- Idaho processing plants could draw raw materials from Oregon and Washington.

Downside risks

- Federal tax incentives are only authorized to 2008.
- If federal incentives go away and diesel fuel returns to $2./gallon, the 2% requirement could increase the price of diesel fuel by $0.02/gallon.
- Idaho Ag ruling currently restricts canola and other brassicas in parts of Southern Idaho.